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FARMERS NEED NOT GAMBLE WITH NATURE IN MAKING HAY

The American farmer today stands a good chance of winning his perennial gamble with Nature at hay-making time. Newer methods of harvesting forage crops -- developed through agricultural research -- plus modern equipment, give him the means for reducing the time lapse between cutting the crop and storing it. Thus, much of the guesswork in saving a hay crop becomes a thing of the past, according to J. B. Shepherd, specialist for the Bureau of Dairy Industry, and L. G. Schoenleber, agricultural engineer for the Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture.

For generations, the scientists point out, a clear sky and a "ready" field have been the signal for the farmer to start haying. But results of a 5-year study by the Department prove that sunny weather can't be depended on to do a perfect job of curing hay.

The study, conducted at the Agricultural Research Center, Beltsville, Md., showed that from one-fourth to nearly one-half of the nutritive value of an alfalfa hay crop may be lost by weather damage when the crop is harvested by the time-honored method of curing in the field. Even when the weather is ideal, the farmer loses a lot of good feeding value before he can get his field-cured hay into the stack or mow.

Much of this loss of valuable nutrients -- dry matter, protein, and carotene -- can be avoided by using methods of harvesting and storing that reduce the time the crop is exposed to the weather in the field. To reach these conclusions, the researchers harvested a field of alfalfa each year by three to four different methods. Some of the crop was cut and left in the field to cure -- with the rain, the wind, and the sun taking their toll. Some was ensiled. Some was dried in the barn, with and without supplemental heat. Some was dehydrated.

The dairy and engineering specialists made full use of modern equipment and modern methods to keep to a minimum the time from cutting to storage, but the time interval varied in different years according to the weather conditions at harvesting time. In 1947, when weather conditions at Beltsville were more unfavorable than usual, the part of the crop to be dehydrated lay in the field for only 1 hour; that to be ensiled, only 3½ hours; that to be barn cured, 28 hours; and that to be field cured, an average of 130 hours.

Samples from the different lots taken as the crop was cut, as it was stored, and as it was fed to milking cows were analyzed, with the following results for the 5-year period. As compared with making good-quality field-cured hay, making wilted grass silage saved 9 percent more dry matter and 20 percent more protein per acre; drying hay in the barn with forced air, but no supplemental heat, saved 9 percent more dry matter and 14 percent more protein; curing hay in the barn with supplemental heat saved 13 percent more dry matter and 16 percent more protein; and dehydrating the hay saved 18 percent more dry matter and 14 percent more protein. Dehydrated hay retained the most carotene; field-cured hay, the least.

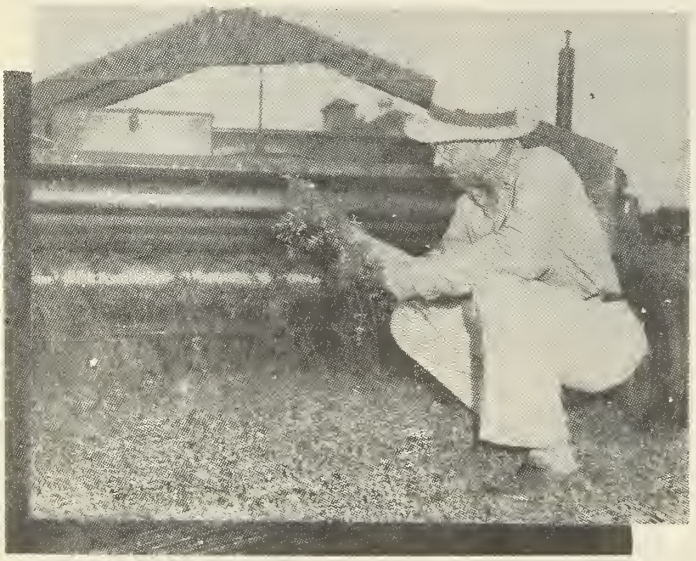
When weather was against making good-quality hay, the quick-harvesting methods proved even more advantageous. For instance, as compared with rain-damaged hay, making grass silage saved 51 percent more protein; making barn-dried hay without heat, 45 percent more; and making dehydrated hay, 44 percent more.

In controlled feeding tests, the four kinds of harvested roughage were about equal in milk-producing value when fed at the same rate on a dry-matter basis. Because of the greater saving of nutrients with the quick-harvesting methods, however, milk production per acre of forage was almost half again as much for silage, barn-cured hay, and dehydrated hay as for rain-damaged field-cured hay. Wilted grass silage was the most palatable of any of the forages. The cows did well on it, even when they received no dry roughage, and produced milk rich in vitamin A -- one of the vitamins essential for good human nutrition.

Total labor requirements, including operation of the machinery, were about the same for making silage and barn-dried hay, but were somewhat higher for dehydrating it. The power and heat needed for barn drying and for dehydration increased the cost. Dehydration called for more labor, but this was due in part to the small capacity of the drier.

8x10 glossy prints of the photos shown are free to writers and editors on request to Press Service, Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

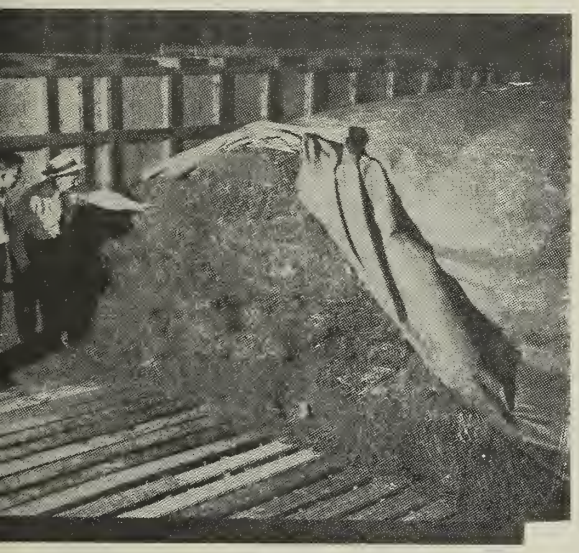
1. Modern machines used in the research on how best to harvest and cure hay include a field chopper, which will cut, chop, and load the crop in the field. The Beltsville tests show that quick harvesting will reduce the losses of nutrients between cutting of the green forage and storage. BDI-28810



2. Operated by a tractor power take-off, this newly developed hay harvesting machine -- the mower-crusher -- helps to save feed nutrients by decreasing the time required for field curing. Here J. B. Shepherd, dairy husbandman at the Agricultural Research Center, examines the stems of cut alfalfa that have been crushed by the heavy rolls of this machine. N-10883

3. A portable blower was connected with a barn at the Agricultural Research Center to dry some of the hay used in the tests. It can be powered by an electric motor or a gasoline engine. Supplemental heat can be supplied from an oil burner in the unit. Here J. B. Shepherd, dairy husbandman, (left) and Lowell E. Campbell, agricultural engineer, make sure it is operating properly to dry some of the hay under test in the barn. N-10686

4 The temperature and humidity of the air blown through the experimental lots of hay being dried in one of the Agricultural Research Center's barns are measured and recorded continuously throughout the test. Here dairy husbandman J.B.Shepherd, using a hydro-thermograph, takes the temperature of some of the field-chopped hay being barn-dried.
N-10689



5. Some of the hay used in the tests was field-baled and barn-dried under canvas on a slatted-floor drier, of the type developed by U.S.D.A. agricultural engineers and the Virginia Experiment Station. The canvas cover forces the air blown in through the ducts (left), by the drier outside the barn, back down over the outside bales, causing them to dry as fast as the innermost bales. Here, Lowell E. Campbell (left), agricultural engineer, and J. B. Shepherd, dairy husbandman, inspect some of the hay being dried.
N-10684

6. Samples from each experimental lot of hay were taken regularly for analysis as the crop was cut, as it was stored, and as it was fed to milking cows. Here Ray E. Ely, dairy specialist, extracts a sample from one of the bales.
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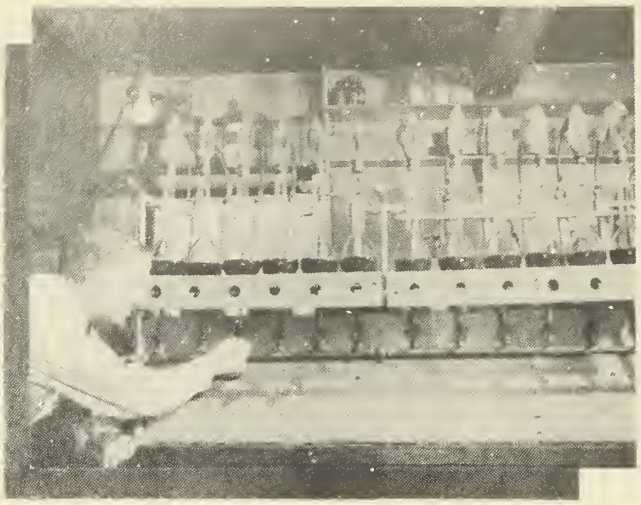
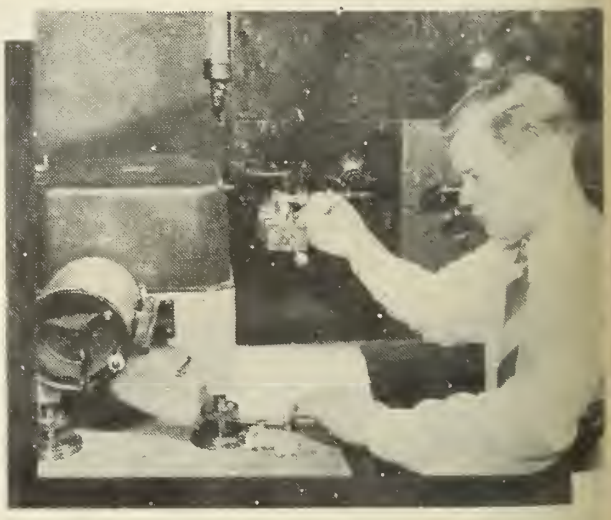


7. Samples from the experimental lots of hay were analyzed as the crop was cut, as it was stored, and as it was fed to milking cows. Here Carl G. Melin, dairy chemist, determines the protein content of a sample. Protein is an expensive ingredient in a dairy ration that has to be bought. Good-quality hay, however, is rich in protein.
N-10471

8. The nutritive value and palatability of hay and silage from the experimental lots were determined by feeding tests with the Beltsville dairy cows. Here Roland Trimble, dairy aide, feeds a ration of grass silage, made by wilting the cut crop slightly and then ensiling it in a tight silo with no preservatives. The Beltsville cows found it most palatable of all the forages fed them.
N-10488

9. The nutritive value and palatability of hay and silage from the experimental lots were determined by feeding tests with Beltsville dairy cows. Here Roland Trimble, dairy aide, leads out a cow from the experimental dairy herd that received wilted grass silage as her only source of roughage for an entire winter, to show how well-fleshed, alert, and sleek cows fed this ration became.
N-10483



10. The carotene content of hay harvested and cured by various methods was determined in the dairy laboratories at Beltsville. Here Herbert G. Wiseman, dairy chemist, makes a final reading on the carotene content of a sample as measured on the spectrophotometer.
N-4316